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Translation of multi-component terms in technical English

Investigation of scientific-technical articles from the viewpoint of terminology is the most important and difficult part in researching of scientific-technical papers, and even the tiniest inaccuracy and change of translated text can lead to incorrect content of the text.

Accurate and literate translation of these papers requires some specific qualifications from the translators. They have to understand the terminology used in foreign language and know the equivalent in the target language, and basic knowledge of both languages. As a result, on the one hand the translator should poses in-depth knowledge of foreign language, methods and techniques of technical translation and, on the other; he must be well up in microelectronics.

A term is a word or word combination from the specific performance field that names scientific or engineering item and defines it.

"Scientific-and-technological" term can be defined as a nominative word group or a noun, or a substantive word combination, connected with definite scientific-and-technological field belonging to a certain text type and expressing a fixed set of item characteristics.

The aim of the article is to research multi-component word combinations, used in microelectronics (by the material of English scientific-technical articles).

The material for the investigation are two English journal articles on microelectronics "A comparative study of several control techniques applied to a boost converter" and "Static performance and parasitic analysis of tapped-inductor converters".

The research tasks are:

1) to find out word combinations, used in articles as terms;
2) to translate them;
3) to analyze their structure and classify according to the word combination formation system, given below.

The results of the linguistic analysis have shown that the following models of multicomponent terms can be singled out in the scientific technical articles:

1) term-model N + N:

Example: *control circuit, integration time.*

2) multi-component attributive word-combinations:

Example: *boost DC-DC converter, input source voltage variations.*

3) term-model (N + Part. I (Ving)) + N:

Example: *man-operating machine.*

4) term-model (N + Part. II(Ved)) + N:

Example: *current-controlled device.*

5) term-model (Adj. + Part. I(Ving)) + N:

Example: *low-loading landing gear*

6) term-model (Adj. + Part. II(Ved)) + N:

Example: *low-powered transmitter – маломощный преобразователь.*

7) term-model (Num. + Part. II(Ved)) + N:

Example: *two-wheeled vehicle*

Table 1 presents the basic types of formation of words combinations typical of scientific technical articles.

There are a lot of single-component and multi-component terms that identified in journal articles which can be classified into several groups:

- double-word terms

Example: *control circuit – схема управления; linearized model-линеаризованная модель*;

- three-word terms

Example: *pulse width modulation – широтно-импульсная модуляция;*

- four-word terms

Example: *switched mode power converter – импульсный силовой преобразователь;*

- five-word terms

Example: *metal-oxide semiconductor field effect transistor – полевой транзистор со структурой металл-оксид-полупроводник.*

Other examples are given in tables 2, 3, 4, 5.

Table 1

Formation of word combination (types)

Ving + N Adv + Ving + N	a decreasing number, an operating device
Ved + N	achieved results, changed operations
Adv + Ved + N	a low-powered transmitter, a round-shaped piece
N + N N + N + N	control process, operation test
N – Ving + N N – Ved + N	current-controlled device, man-operating machine

Table 2

N + N and N + N + N terms

Boost DC-DC converter	Повышающий преобразователь постоянного напряжения
Control circuit	Схема управления
Input source voltage variations	Изменения напряжения источника входного сигнала (источника питания)
Component tolerance	Допуск на элемент
Pulse width modulation	Широтно-импульсная модуляция
Response time	Время реакции
Duty ratio	Коэффициент заполнения
Zero-pole location	Расположение нулей и полюсов
Integration time	Время интегрирования
Differentiation time	Время дифференцирования
Voltage gain	Коэффициент усиления по напряжению
Compensator gain	Коэффициент усиления коррекционного устройства
Voltage conversion range	Диапазон преобразования напряжения

Table 3

Ved + N terms

Tapped inductor controller	Преобразователь с отводом дросселя
Tapped connection	Соединение с отводом
Closed loop performance	Характеристики замкнутой системы
Linearized model	Линеаризованная модель
Switched mode power converter	Импульсный силовой преобразователь

Table 4

Ving + N terms

Switching signal	Сигнал переключения
Setting time	Время установления
Modelling mismatch	Ошибка моделирования
Operating point	Рабочая точка
Switching losses	Потери на переключение

Table 5

Adj + N terms

Nonlinear model	Нелинейная модель
Continuous current mode	Режим непрерывного тока
Discontinuous current mode	Режим прерывистого тока
Feedback linearizing controller	Регулятор линеаризации по обратной связи
Operational amplifiers	Операционные усилители
Static gain	Статический коэффициент усиления
Parasitic component	Паразитная составляющая
Critical mode	Критический режим
Steady state	Установившийся режим

Table 6

N – Ved + N terms

Phase-shifted DC-DC converter	Сдвинутый по фазе преобразователь постоянного напряжения
Computer-aided design (CAD)	Компьютерное проектирование

The primary ways that are used for translation of terms are:

1. Descriptive translation. Word translation is represented by extended explanation of meaning of English word. It's used, when there isn't corresponding meaning in vocabulary or in Russian language.

Example: *Hybrid system approach – система аппроксимации с непрерывным и дискретным управлением.*

2. Translation with help of genitive case

Example: *Modelling mismatch – ошибка моделирования*, *duty ratio– коэффициент заполнения.*

3. Transcribing. Word translation is represented by Russian letters. It's used as a main method to translate names, company's and corporation's names.

Example: *MOSFET-transistor – мосфет-транзистор.*

4. Calquing. Word translation is represented by exact reproduction of English word with the help of the same Russian words (word for word translation).

Example: *Nonlinear model – нелинейная модель.*

5. Translation of terms with the help of prepositions

Example: *Feedback linearizing controller – регулятор линеаризации по обратной связи, tapped-inductor – дроссель с отводом.*

As it can be seen from the tables, the major part of the word combinations is formed by <N+N> way, and its different types (Table 2).

Moreover, other ways of formation of word combinations are typical of journal articles too. For example, Part II(Ved)+N (Table 3), Part I(Ving)+N (Table 4), Adj+N (Table 5), N-Part II(Ved) + N (Table 6).

On the basis of the linguistics analysis it may be concluded that scientific-technical articles are rich in multi-component word combinations. Preposition "of", conjunctions "that" and "which" are kept to a minimum. For example, the sentence *"controller that linearize with the help of feedback"* is absolutely identical in meaning to word combination *"feedback linearizing controller"*. This way of word formation makes the text more difficult for understanding, but at the same time it makes the text more laconic and conforms to scientific-technical style.

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